

AMENDMENTS TO THE SPECIFICATION

Please replace in the specification, the abstract on page 29, with the following paragraph:

Some embodiments provide a method of performing mode selection in a video compression and encoding system. The method encodes with several encoding modes from a set of encoding modes. The method computes a distortion value for each encoding mode from the several encoding modes. The method computes a bit rate value for each encoding mode from the several encoding modes. The method computes a Lagrangian value for each encoding mode from the several encoding modes, using the distortion value, the bit rate value, and a Lagrangian multiplier. The method selects an encoding mode based on the Lagrangian values.

In some embodiments, computing the distortion value includes using a function that reduces the effects of outliers. In some embodiments, the Lagrangian multiplier is a slow varying Lagrangian multiplier that varies at a slower rate than a varying reference Lagrangian multiplier for a reference encoding mode. In yet some embodiments, the method clusters the Lagrangian values.

~~In this disclosure, a novel method for direct mode enhancement in B pictures and skip mode enhancement in P pictures in the framework of H.264 (MPEG 4/Part 10) is disclosed. Direct mode and skip mode enhancements are achieved by clustering the values of the Lagrangian, removing outliers and specifying smaller values of the Lagrangian multiplier in the rate distortion optimization for encoding mode selection. Experimental results using high quality video sequences show that bit rate reduction is obtained using the method of the present invention, at the expense of a slight loss in peak signal to noise ratio (PSNR). By conducting~~

~~two different experiments, it has been verified that no subjective visual loss is visible despite the peak signal to noise ratio change. In relationship to the existing rate distortion optimization methods currently employed in the (non-normative) MPEG 4/Part 10 encoder, the method of the present invention represents a simple and useful add on. More importantly, when other solutions such as further increasing the values of the quantization parameter are not applicable, as inadmissible artifacts would be introduced in the decoded pictures, the method of the present invention achieves bit rate reduction without introducing visible distortion in the decoded sequences. Even more, despite the fact that the present document makes use of the H.264 framework, the proposed method is applicable in any video encoding system that employs rate distortion optimization for encoding mode selection.~~